ASSESSMENT PROGRESS PREPORT 2014 - 2015 ACADEMIC YEARS)

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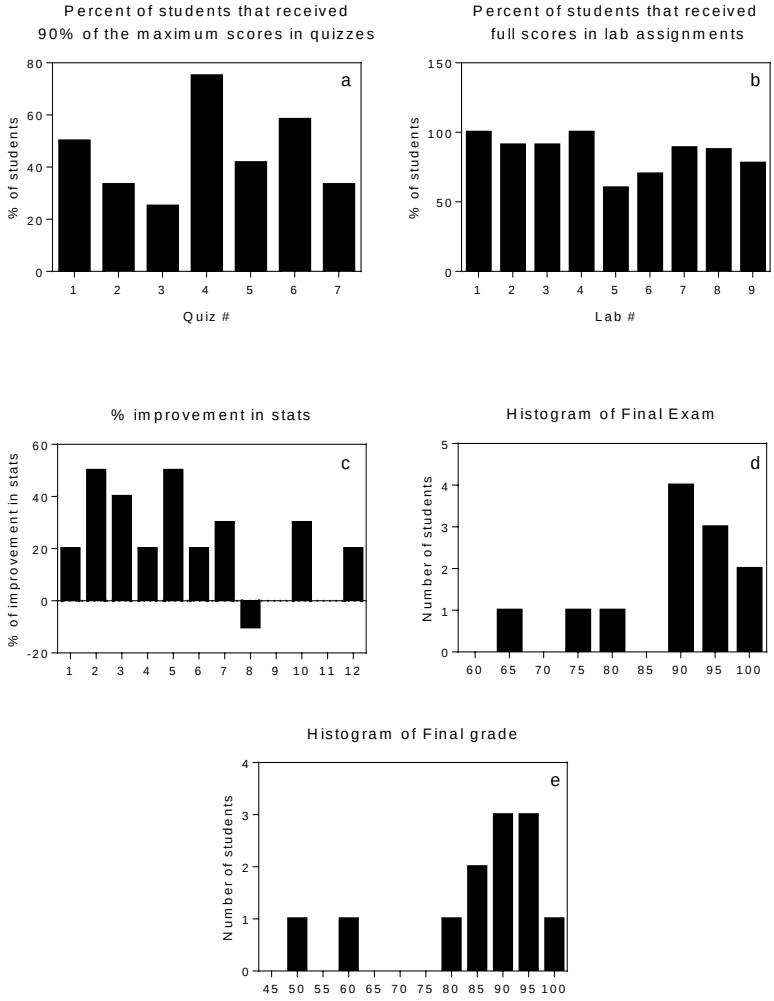
OUTCOME MEASURED	**Course Learning Outcome:** NDFS 5100 Sensory Evaluation of Food. The primary core competency addressed in this class is for students to 'analyze and interpret sensory data using different statistical methods.' In NDFS 5100 this is achieved via three complementary foci. Students should be able to… • Discriminate between the use of difference, descriptive and consumer tests according to the type of sample and the objective of the project. • Interpret sensory data in food systems and suggest appropriate actions according to the results obtained • Plan and execute sensory tests and report the corresponding results using technical and non-technical language
Method(s) of Assessment	At the beginning of the semester students are assessed for their statistics comprehension by examination. Each year the course content is adjusted to ensure students have working knowledge of the various tests used in the course. Outcomes are measured using quizzes, lab reports, and final exams. Quizzes are used to assess knowledge of specific topics taught during the semester, and each quiz is associated with a section of the class. The subject quiz topics are provided in the Appendix. Laboratories and lab reports are designed to assess student learning in more depth in specific areas of sensory science. The topics are listed in the Appendix. The final exams is comprehensive and is used to evaluate all three learning outcomes above.

Summary of Key Findings

Figure 1 shows a summary of the grades obtained for quizzes, labs, pre- and post- tests and finals.



Outcomes were assessed with quizzes by quantifying the percentage of students that achieved more than 90% of the maximum score in each quiz. Figure 1a shows a high student performance for quiz 4 that tested acceptance and preference tests while a lower student performance for quizzes 2, 3, and 7. Students have expressed their concerns on the difficulty they have of identifying difference tests for specific application and it is possible that this low performance in the quiz is due to this difficulty.

Lab reports were used to assess the outcomes by quantifying the percentage of students that received full scores for their reports. Figure 1b shows that fewer students received full score for their lab reports in labs 5 and 6. These laboratories are related to acceptance and preference tests and descriptive tests and have a heavy statistical component. In general students that did not receive full score for their lab reports had incomplete or poor statistical analysis of their results.

Even though students struggle with statistics in the sensory class it is evident from Figure 1c

	that their statistical skills improved during the semester. This figure shows the improvement in statistical skills during the semester. Most of the students showed an improvement between 20-50% s, one student performed worse at the end of the semester, one student did not change. In the final exam students are presented with a sensory question and asked to choose the appropriate test to address the problem. In addition, they are asked analyze the data using the appropriate statistics test, and to interpret the results The final is comprehensive and assesses student abilities across all three specific learning outcomes for this course. Figure 1d shows a cluster of high grades, with a few students on the lower end of the grade scale. Figure 1e shows the final grades. One outlier was a student who did not complete the labs. Results from quizzes, lab reports, and final exams demonstrate the students have met most of the learning outcomes of this course and that are able to design appropriate sensory tests, collect data, and analyze and interpret the results obtained. However, students still struggle with the use of statistics.

I. PROGRAM OUTCOME(S) OR COURSE LEARNING OUTCOME(S) THAT WERE ASSESSED IN THE 2012-2013 ACADEMIC YEARS, METHODS USED, AND KEY FINDINGS

List the outcomes that were assessed, the methods that were used to assess each outcome, and summarize key findings. Attach all relevant rubrics. Add more boxes if more than three outcomes were assessed. **The first set of boxes provides an example of course learning outcomes, assessment techniques, and summary of key findings.**

OUTCOME MEASURED	**Program Learning Outcome:** Interaction skills (i.e. teamwork, mentoring, leadership, networking, interpersonal skills, etc.)
Method(s) of Assessment	In 2014-2015, Interaction skills were assessed in four upper division classes, Food Engineering (NDFS 4440), Dairy Processing (NDFS 5030), Product Development (NDFS 5920) and Food Analysis (NDFS 5500) which were all taught by different faculty members. In Food Engineering, assessment of teamwork was made both directly and indirectly. In this course, the first of three exams is taken in teams, while the second two are taken individually. Comparison of the performance of the group exam to the individual exam gives an indication of group performance. In addition, as the professor monitors the group exam, assessment of individual student contribution is made as well. In Dairy Processing, evaluation of teamwork was assessed via a group assignment. In the teams, students took turns in directing the activities of the team, such as in cheese making, and in preparing reports of the work. Students evaluated their own performance as team leader, and the leadership qualities of others. Food Analysis is a laboratory intensive course in which student work in groups to carry out analytical procedures. In this class, the instructor assessed the team interactions during lab and evaluated students according to their interactions. In Product Development, students work in teams and interaction skills were assessed by the professor.
Summary of Key Findings	According to the professor of food engineering, engineers seldom work independently. Engineers' work is usually checked by at least one other colleague. Often projects are divided into parts with an engineering team made up of individuals or teams that handle a specific part of the project. Thus, this is a good course in which to involve group

	projects and in which to assess team work. Over the last two years, the average score for the team-taken exam has averaged 15% higher than exams taken individually. According to the professor, this is not simply driven by the strongest members of the team, but rather is the fruit of discussion and argument between team members. In Dairy Processing, students were awarded points for submitting teamwork assessments, but the assignment was not graded for quality. Thus, the main outcome of this assessment was a collection of student reflections on their own performance as well as that of their peers. Based on the student submissions, the presence of this exercise caused students to reflect on the dynamics of their team function and their role in it. Students identified which members of the team were necessary, and which were not. In Food Analysis, teamwork assessment was qualitative and indicated there was open and constructive exchange between individuals during laboratory. The instructor was provided a rubric for teamwork evaluation prior to the course starting, but did not use it as the group interaction between students was neither sufficiently formal nor substantial to apply numerical values. In Product Development the assessment was also qualitative. In this case, the leadership of the team was not specified, and the instructor noted it was common for one team member to dominate. While group projects in this class are common, to date the assessment has primarily been on the final results of the project, without reflection as to how this was affected by the team interaction.
OUTCOME MEASURED	**Program Learning Outcome:** Organizational skills (i.e. time management, project management, etc.)
Method(s) of Assessment	Organizational skills were assessed in two upper division courses, Product Development (NDFS 5920) and Meat Technology and Processing (NFDS 5020). In Product Development, the assessment was indirect and was conducted by evaluating the organization of the student's final project in terms of a paper assignment, a poster and an oral presentation. In Meat Technology, the assessment was conducted indirectly by evaluation of data presentation in laboratory reports and in evaluating accuracy and detail in practicum assignments.
Summary of Key Findings	In Product Development, it was determined in recent years that the final projects suffered from a lack of organization. The professor attributed this to the fact that the projects tended to have a lot of work required at the end of the semester and that students were not effective at organizing their work and conducting it in a timely manner. Projects were evaluated qualitatively according to several criteria which are listed in the Appendix, and it was determined that students were not addressing several key aspects of the project. Therefore, to address this concern, the professor made several changes in the last few years. First, she used guest lectures to provide students more information on acquiring ingredients and in understanding markets. Next, to improve time management, the project was broken into sections with sequential deadlines for each section. In Meat Technology, it was determined that there are essentially two populations of students with respect to organizational skills. In one group the lab reports and

	assignments are clearly presented and turned in on time. In the second group, the data presentation is less clear and organized. While the strength of these observations is limited by the lack of quantiative data, the findings are nonetheless of interest to us as we seek to improve our program.

II. ACTIONS BEING TAKEN AS A RESULT OF THE ABOVE RESEARCH FINDINGS

In the space below, interpret the above research findings in light of program expectations for student achievement. Discuss the meaning of the learning assessment findings in relation to desired student proficiency. Describe how these findings were used, or are being used to improve student learning (very important). If changes are being made to courses or the food science program, summarize these changes. If lessons were learned during implementation of the learning assessment, and changes will be made to future assessments as a result, discuss here. (Sometimes an assessment does not go exactly as planned and it is not possible to draw conclusions reliably. If this occurred, describe what happened and what will be done in the future to remedy it.)

We received our IFT accreditation in 2011 and we are currently in our last year of using that assessment plan, as we will submit a renewal application in 2016. One issue with our current assessment is that the author of our 2011 plan (Daren Cornforth) retired in 2013 and was replaced by Robert Ward. In the last three years we have received valuable input from IFT regarding our assessment and ways we should improve it. Nonetheless, there are still weaknesses that have not been addressed, which we are aware of, and which we are working to address systematically in our reapproval application.

IFT has encouraged us to directly and passively collect quantitative data on student performance. This sort of activity is intuitive for faculty with respect to specific courses (as shown above for Sensory), but less so for success skills such as critical thinking, organization and personal interactions. We listed in 2011 that we would evaluate these skills at this time, but did not specify how. Thus, for 2014-2015 we are mostly evaluating these skills qualitatively. Prior to the 2014 academic year we discussed rubrics for such evaluation, but the faculty in charge of assessing these skills did not feel that the assessments planned were substantial to use such a system. As we build longitudinal assessments into our reapproval application, we will work as a faculty on a suitable evaluation methods before the class is taught, and across classes to assess students over time. As we have discussed the information collected in 2014-2015 we all agreed that our qualitative observations of students are difficult to act upon and evaluate if we cannot put numbers to the observations.

As described above, we had two courses in which teamwork was specifically assessed (Food Engineering and Dairy Processing), and two courses in which it was passively assessed where group interactions permitted. We did learn two important items from this exercise. First, group projects triggered student awareness as to the function of the group and of their role in it. Additionally, in Product Development it was observed that some students tend to dominate groups. Yet, we have realized that although we are assessing teamwork, we cannot evaluate student development of this skill or our effectiveness in teaching it, as instruction in teamwork is not a defined part of our curriculum. As we are developing an improved assessment plan, we realize that in order to evaluate the development of skills (such as teamwork), we need to present students with rubrics against which they will be evaluated, at a minimum. Clearly it would be preferable to actually provide instruction on areas we want them to develop and behaviors which we might not want to encourage (domination of team).

With respect to the course evaluation of Sensory Science, we had a couple of interesting observations. First, we tend to have two distributions of students in our department. One group of students is highly motivated and will complete course requirements with little prompting. The other group tends to be disorganized, less professional and receives lower grades, and this can be exacerbated by a heavy workload. In the last few years several faculty members have noticed this and have addressed it by breaking down large assignments into smaller pieces which are due sequentially as the course unfolds. Preliminary indications are that such structuring improves student performance on individual projects, but it is not clear that this activity is actually beneficial for student development, and eventual dependability in the workforce.

Another point we can take from this year's assessment is that our 2011 plan did not have a plan to evaluate our students longitudinally, as assessment for success skills such as organizational skills and interpersonal skills were only scheduled to be assessed in upper division courses. As we work on the reapproval application are mapping the core compentencies and success skills onto our curriculum and identifying places to start evaluating students in introductory courses and to continue as the curriculum unfolds.

We realize from our 2014-2015 assessment is that our food analysis class lacks relevance to the actual analyses done in food companies. Thus, the instructor is in the process of redesigning this course. As it is taught now, the class comprises a series of methods that are used to

measure components in foods, many of which are outdated. While we have justified the inclusion of these methods in the past rationalizing that they teach the *principle* of the analysis, one outcome is that we are missing an opportunity to properly prepare our students for work they will do in the food industry. In addition to adjusting the content of the course to reflect industry relevance, the goal of the instructor is to structure learning activities to allow better assessment of success skills, such as leadership, teamwork and organization.

Resource: Permission to use this form granted by Lisa Kramer info@PAERconsulting.com.

Appendix

Table 1: Assessment of sensory topics via quizzes

Quiz	Topic assessed
1	The senses – importance in sensory science
2	Biases in sensory tests – use of scaling tools in sensory tests
3	Difference tests
4	Acceptance and preference tests
5	Descriptive tests
6	Selection and training of sensory participants – setting up sensory tests
7	Time intensity and threshold tests

Table 2: Sensory topics covered in laboratory exercises

Lab #	Topic assessed
1	Sensory adaptation
2	Introduction to chemical senses
3	Comparison of scaling methods
4	Difference and paired comparison tests
5	Acceptance and preference judgments
6	Descriptive analysis
7	Visual and appearance evaluations
8	Threshold tests
9	Time/intensity tests

Table 3: Qualitiative rubric used to assess product development projects

	Project coverage
1	Identifies the target market
2	Understand the market in general for the food product
3	Identifies ingredient choices and levels
4	Understands nutrition labeling and claims
5	Understands the safety concerns
6	Understands processing parameters

APPENDIX G

Rubric for Evaluating Assessment Progress Reports

	Not yet developed	In development	Developed
Degree to which outcomes are defined and lend themselves to assessment and student learning	There is little or no evidence that outcomes exist for the course or program	Outcomes exist, but are incomplete or do not address all of the desired outcomes for the course or program; or, student learning outcomes exist, but faculty are unable to assess them	Outcomes exist, and lend themselves to assessment
Degree to which assessments address outcomes	There are little or no assessments used to assess course learning outcomes or program outcomes	Assessments exist, but have not yet been summarized, aggregated or analyzed for communication to faculty; or, assessments are reported only episodically (not regularly)	Assessments exist, and have been communicated to faculty on a regular basis
Degree to which faculty meaningfully discuss students' achievement of outcomes and make recommendations to act	Faculty discussions about assessments have not yet occurred on a formal basis, or have only been discussed intermittently and in starts	Faculty discussions about assessments have occurred, but only informally and among a few	Faculty discussions about assessments directly evaluate student learning outcomes and occur on a regular basis
Degree to which discussed actions are implemented in areas such as instruction, curriculum, course learning objectives, etc.	There is no evidence that assessment-based discussions have led to action or to any change	There is some evidence that assessment-based discussions have led to action or change; or, there is some evidence that recommendations based on assessment-based discussion have been enacted	There is ample evidence to demonstrate that assessment-based discussions have led to action; or, there is ample evidence demonstrating that recommendations based on assessment-based discussions have been enacted